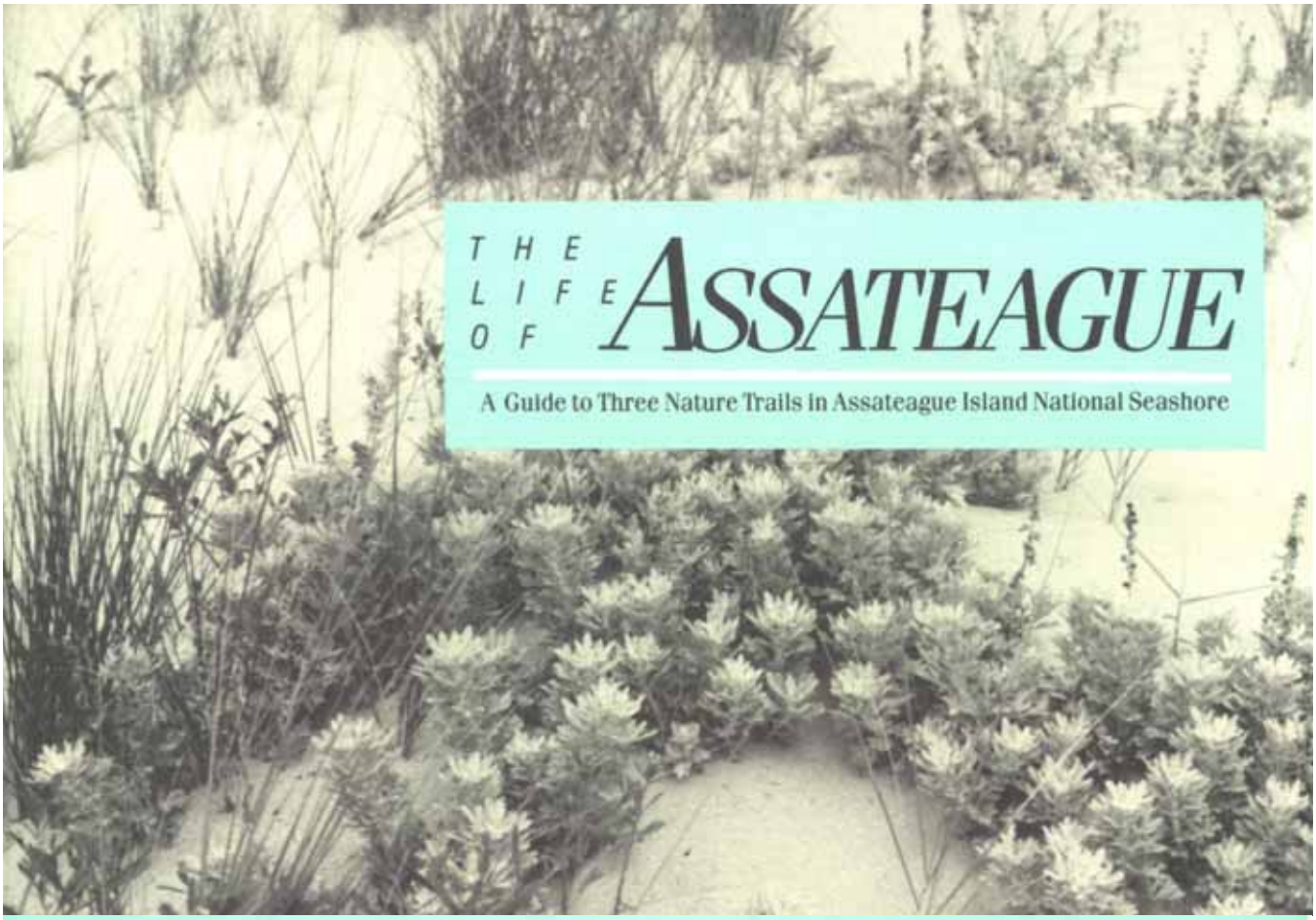

THE LIFE OF ASSATEAGUE

A Guide to Three Nature Trails in Assateague Island National Seashore

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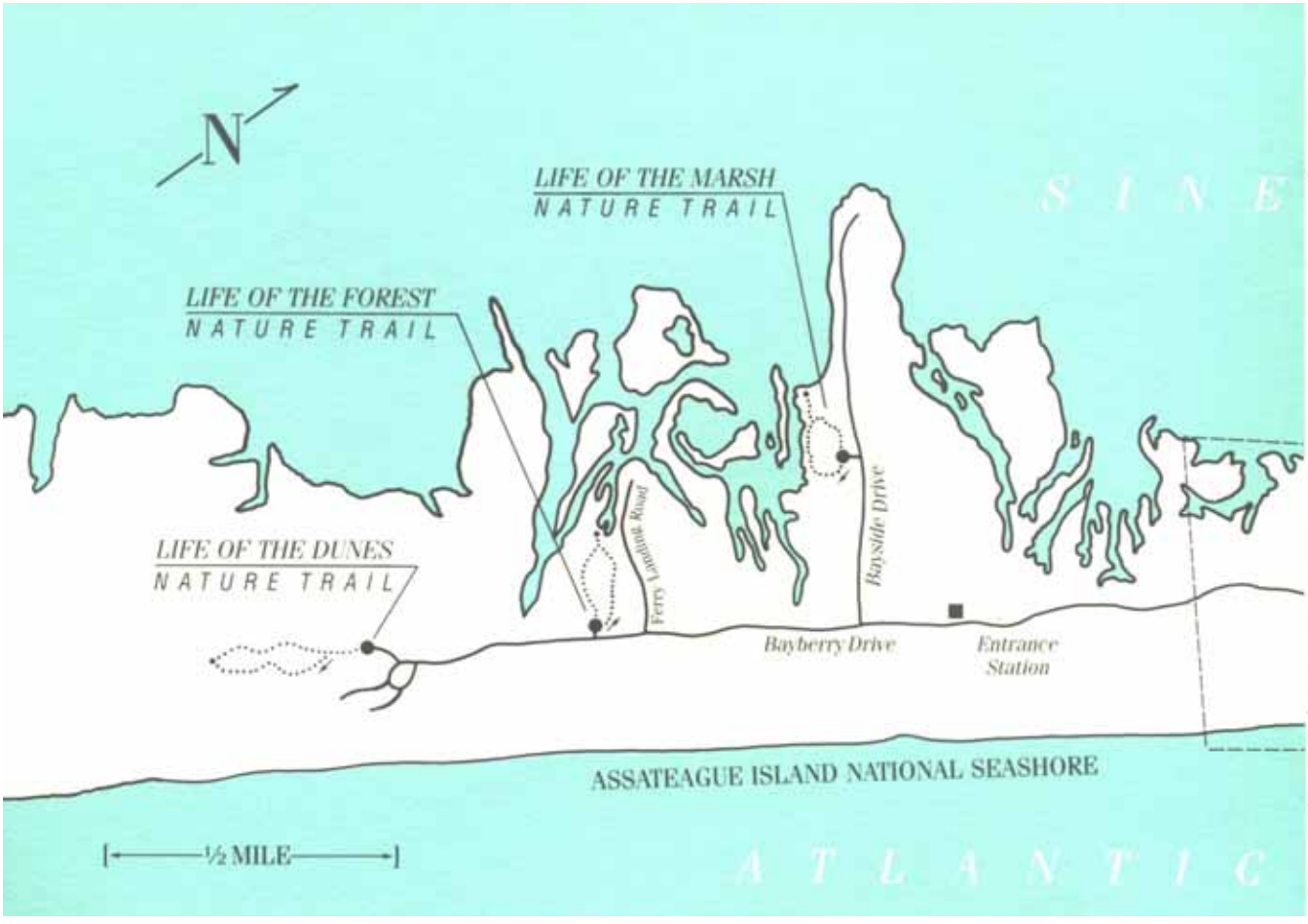
THE LIFE OF ASSATEAGUE

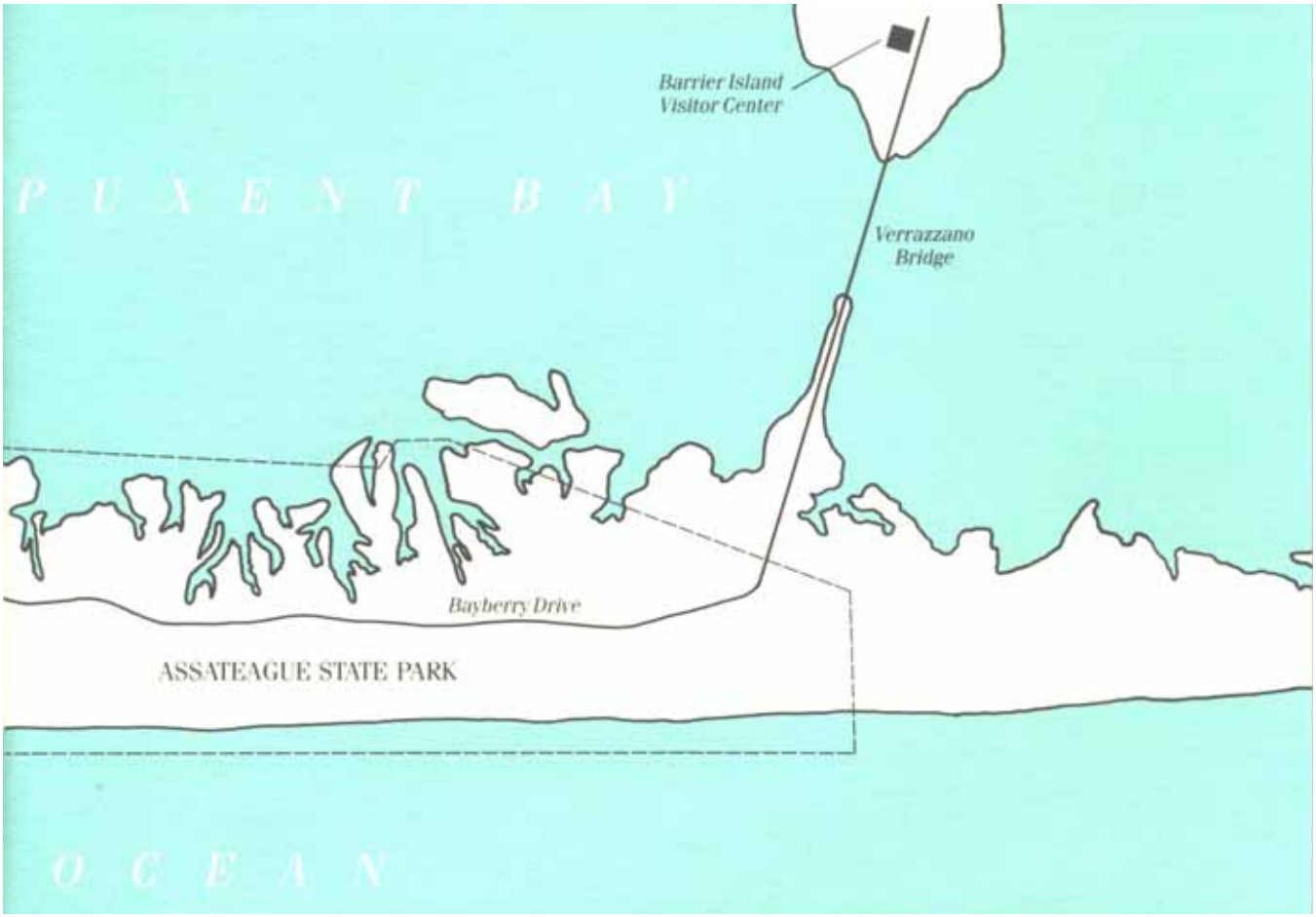
A Guide to Three Nature Trails
in Assateague Island National Seashore

Life of the Dunes ~ Life of the Forest ~ Life of the Marsh

Text and Photographs by Bill Perry

Drawings by Robert Hynes





BARRIER ISLAND COMMUNITIES

Three short (half-mile) nature trails take you through the major life communities of Assateague Island, one of a loose chain of barrier beaches hugging the Atlantic coast from Cape Cod to the southern tip of Florida. Winds, coastal currents, and tides were the primary physical forces that built these beaches, using sand carried from the uplands by streams flowing into the ocean. These forces continue to reshape the barrier and influence the life forms that inhabit it.

Certain "pioneer plants" that are able to take hold on a new barrier stabilize the shifting sands and enhance growing conditions for other plants; the resulting denser and more varied vegetation

provides cover and food for an increasingly diverse animal community.

The associations of organisms making up Assateague's life communities are more akin to those on other barrier islands of the Middle Atlantic coast than they are to nearby mainland environments. The species makeup of these communities is determined largely by adaptations to the special conditions prevailing here: extremes of aridity and moisture; exposure to wind, sun, and salt; isolation from mainland food resources and predators; instability of the soil, etc.

Of the three communities traversed by these trails, the duneland is under the most direct influence of ocean winds. The woodland community is relatively sheltered; but, as you will see, it has characteristics not found in most mainland forests. The organization of the living community of the bayside salt marsh is determined more by subtle differences in elevation than by the winds.

Your experience on these trails will be enhanced if you are equipped with binoculars, a hand lens, sharp eyes, and keen ears. For further understanding of the geology and biology of barrier beaches, you might consult some of the books listed in the back of this guide.

LIFE
OF
THE

DUNES

1 *TRACKS IN THE SAND. In the desertlike conditions of the dunelands, most animal activity—other than that of birds—is nocturnal. Look for tracks in early morning before the breezes have had time to obscure them. Some are easy to recognize. The doodlebug (antlion larva) leaves a winding, continuous trail as it pushes its way through the surface sand. The red fox leaves dainty doglike pawprints in a fairly straight line. Hardest to identify are the tracks of birds. The boat-tailed grackle spends a lot of time walking over the sand; it does not hop or flit about like many birds, and it leaves a great many wandering tracks.*

Hognose Snake tracks.

Hudsonia and Dune Grasses.

2 *PLANTS THAT TRAP SAND. Duneland plants, like animals, are able to compete and survive in this habitat only by virtue of adaptations to the harsh environment. Pioneer plants create the conditions that enable others to get a foothold. American beachgrass (also called dunegrass and marram) and woolly hudsonia (beach-heather) are such pioneers; they play a major role in the building and stabilization of the dunes. The descending roots and spreading underground stems of dunegrass anchor the sand; the parts of the plants above the surface trap blowing sand and help to build up the dune. Note how hudsonia holds fast when the loose sand about the clumps has been removed by the wind. In some*

Assateague sites, panicgrass may be more prevalent than beachgrass. These are natural processes; but humans often use picket fences or discarded Christmas trees as sand-trapping devices to enhance the building of dunes. All this helps to preserve the barrier beach—*so called because it forms a buffer against the onslaught of oceanic waves and storms on the mainland shore.*

3 *SHRUBS IN THE DUNELAND. Owing to a good supply of moisture and the protection from saltspray provided by the man-made ocean foredune (often called primary dune), a heavy cover of shrubs has developed in this interdune area. Beachgrass, poison ivy, hudsonia, and bayberry predominate. This vegetation builds up organic matter in the soil and provides food and cover for both vertebrates and invertebrates. If the high foredune endures, this area, through the normal process of natural succession, may become part of the Assateague forest community.*

4 *BAYBERRY. Unlike the closely related evergreen wax-myrtle* (Myrica cerifera), *northern bayberry* (Myrica pensylvanica) *loses its leaves in autumn. By late summer the small green berries become blue-gray with a coating of wax. These berries persist through winter, providing food for marsh and shore birds, quail, many songbirds, and foxes. Animal droppings spread the small seeds (55,000 to the pound!), helping to account for the widespread occurrence of the plant. One bird particularly associated with* Myrica *is the yellow-rumped warbler (formerly known as myrtle warbler), which nests in northeastern U.S. and Canada and has a southern wintering range that extends up the east coast to Long Island.*

Northern Bayberry loses its leaves in winter; the fruits are a food resource for birds.

This species is so well adapted to a diet of bayberries that some individuals remain the year around on barrier islands of the Middle Atlantic coast. Cottontails and white-tailed deer feed on the foliage of these shrubs. The fragrant wax coating of the berries was used by colonists in making candles.

Identification of these two species of Myrica *is difficult, and hybridization is not uncommon. The leaves of northern bayberry are generally more than ½" wide, those of wax-myrtle less than ½". Fruit will not be found on all specimens, since male and female flowers are borne on separate plants. In Assateague's protected interior, wax-myrtle may attain the size of a small tree (20 ft.).*

Wintering Yellow-rumped Warblers feed heavily on bayberries.

5 *MARSH VEGETATION. In blowouts and other depressions where the surface is close to the underlying water table, pools form during rainfall and the sand remains moist enough to support a growth of rushes and sedges—plants most often associated with freshwater wetlands. Darker soil indicates the location of these damp depressions; rushes and sedges are prominent here.*

Muskrats and cottontails feed on rushes. The seeds of sedges are eaten by a wide range of waterfowl, marsh and shore birds, songbirds, and mammals; and some hoofed mammals browse on the plants.

6 *DUNELAND WILDFLOWERS. Growing on the coast from the Gulf of St. Lawrence to Florida, the adaptable seaside goldenrod adds an autumn splash of yellow to dunelands and forest openings. It reaches 3 or 4 ft. on Assateague Island. You can distinguish this species from other goldenrods by the often fleshy lower leaves, which clasp the stem at their bases. Some less showy wildflowers display great beauty when observed closely; among these are purple gerardia (in damp spots), blue toadflax, and seabeach evening-primrose. The myriad tiny (¼-in.) yellow blossoms of hudsonia blanket Assateague's dunes at varying times in May. To fully appreciate their delicate beauty you must get down and examine them with a hand lens.*

7 *HOGNOSE SNAKE. The reptile most closely associated with duneland environments is the eastern hognose. All snakes are predators. The chief prey of the adult hognose is Fowler's toad, which shares its range and habitat; young hognose snakes eat insects. This species is famous for its bluffing defensive behavior, which includes striking at an intruder—but not making contact. If this fails to deter, the snake may roll over and play dead. Do not molest this interesting reptile; despite its seemingly belligerent actions it is harmless. Part of the island food web, the hognose feeds on amphibians and insects and is itself food for foxes, hawks, and owls.*

THERE ARE NO POISONOUS SNAKES
ON ASSATEAGUE ISLAND.
DO NOT MOLEST ANY SNAKE.

Hognose Snake in defensive posture, with head flattened cobralike, poised to "strike."

The same snake a few minutes later, "playing dead."

Wild Black Cherry blossoms and fruit.

8 *WILD BLACK CHERRY. You will see this tree in many areas of the island and in varying growth forms. It is small in the duneland edge zone, but grows tall in the mainland forest, where it may reach 100 ft. This specimen has plenty of growing space; but it is stunted by the pruning effect of salt spray, and so may grow no taller.*

The black cherry is important to wildlife and humans. The fruits are eaten by many Assateague animals, including quail, songbirds, fox, cottontail, raccoon, and white-footed mouse. Deer eat the foliage. The wood has been used in making furniture, tool handles, veneers, and cabinets. In spring the profuse clusters of white cherry blossoms and the pink flowers of crabapple trees brighten the island scene.

9 *DUNELAND FUNGI. The crowned earthstar is adapted to the desertlike conditions of the dune zone. This relative of the puffballs is common on east-coast barrier beaches. Unlike green plants, which use sunlight as an energy source to manufacture their food from raw materials, these fungi derive their nutrients from organic material in the soil. The fruiting body of the earthstar (the part above the surface) has a ball-like inner spore sac covered by a thick outer layer; when rain brings moisture the outer layer splits open and the pointed segments curl downward, sometimes raising the plant above the ground.*

Earthstar Fungi are common in barrier island dunelands.

10 *THICKET ZONE. Where duneland meets forest, species of plants that are common in one or the other community occur together, often forming a dense thicket. Narrow or broad, this transition zone, or ecotone, tends to have a greater diversity of both plant and animal life than either of the two communities it borders. This phenomenon is called "edge effect." The woody plants of the Assateague thicket zone include six common climbing or trailing vines (poison ivy, Muscadine grape, Virginia creeper, greenbrier, trumpet creeper, and blackberry), and several erect shrubs and small trees (highbush blueberry, bayberry, wax-myrtle, wild black cherry, sumac, holly, loblolly pine, and red maple, along with shrub-form poison ivy).*

11 *BIRDWATCHERS TAKE NOTE. Some forest birds are most abundant in the thicket zone, and some birds of the open dunes are observed in much greater numbers in the thicket. In this zone on Assateague Island you will find the catbird (rarely seen far from dense shrub growth), towhee, brown thrasher, yellow warbler, mourning dove, robin, cardinal, bobwhite quail, and—in winter—American goldfinch, white-throated sparrow, and yellow-rumped warbler.*

Blackberry.

Muscadine Grape.

Virginia Creeper.

12 *MARITIME INFLUENCES ON FOREST TREES. In mainland areas of this region, oak species often grow in dense forests of broadleaf and pine trees. Competing for sunlight in such close quarters, oaks tend to grow tall and straight; but here in the duneland edge zone, isolated from the forest community and exposed to salt-laden ocean winds, a southern red oak has taken on a low, spreading form. Notice its short, thick trunk. The accumulation of old oak leaves on the ground under the tree will gradually decay. This adds organic matter to the sandy soil, helps conserve moisture, and makes the environment more hospitable to other plants. Acorns are food for white-tailed deer, red fox, raccoon, grackle, towhee, and brown thrasher. (Squirrels are rare in the Maryland sector of Assateague Island.)*

Note also, here and along the trail immediately ahead, loblolly pines that have been greatly distorted by the effects of salt air pruning. In forests well beyond the influence of salt spray, this species grows tall and straight.

Southern Red Oak is common here; the other three species are widespread but infrequent on Assateague.

13 *AMERICAN HOLLY. Note how this specimen has been pruned by salt spray. The holly is a dominant species in Fire Island's "Sunken Forest" and the maritime forest of Sandy Hook, NJ. It is a minor element on Assateague Island; but where it does occur it provides good year-round cover for birds and other animals. Male and female flowers of this species are on separate trees; this female specimen would not bear fruit if a male tree did not grow nearby.*

Holly berries are eaten by mockingbirds, robins, catbirds, towhees, brown thrashers, and other birds of the forest-dune ecotone; white-tailed deer browse on the leaves and twigs.

14 *WOLF SPIDERS AND ANT LIONS. You will see many vertical burrows, about the diameter of a pencil, in these dunes. Some are the homes of wolf spiders. Their burrows are lined with silk, which holds the sand grains together, helping keep the burrow walls intact. The best time to see one of these small predators is at night, when its four largest eyes (of a total of eight) shine as green points in the glow of your flashlight. This arachnid is a terror to the insects upon which it pounces, but it is preyed upon by dune-dwelling spider wasps.*

The conical pit of the antlion larva is often found at the end of its winding track. The adult antlion, a graceful, inch-long flying insect, does not prey on ants—in fact, it does not feed at all. But the larva,

Wolf Spider at burrow entrance.

known to most as a doodlebug, is a voracious carnivore. It digs its pit in dry sandy or dusty areas, then lies in wait in the bottom with only the tips of its sickle-like jaws visible. When an ant or other insect tumbles into the pit, the doodlebug tosses sand up and over it; this causes little avalanches and prevents its escape up the steeply sloping sides. When the doodlebug finally seizes its victim, it pulls it under the sand, sucks it dry, and ejects the carcass.

Antlion adult
and larva (doodlebug)

15 BLOWOUTS. Deposition and erosion are the processes that shape the barrier beach. Dunes, created when sand is blown onshore from the beach, are continually reshaped by the winds, and tend to migrate toward the mainland. This movement is slowed when such pioneer plants as beachgrass, dusty miller, and seaside goldenrod take hold. The wind sometimes removes all the loose sand from a site, creating a blowout *nearly or completely devoid of rooted plants. Adjacent to or within such a blowout may be an elevated remnant of the original dune held together by the root systems of hudsonia, bayberry, or other shrubs. The dunes may eventually become stabilized by thicket and forest vegetation. These hardy plants thus slow the barrier beach's inevitable march toward the mainland.*

Human traffic on vegetated dunes can damage or destroy the stabilizing plants, leading to blowouts.

LIFE OF THE FOREST

1 A SAFE TRAIL EXPERIENCE. It is wise to stay on the designated trail in these woodlands. You will enjoy and benefit most from the experience if you don't come into contact with three living things in this habitat that may be injurious: greenbrier, poison ivy, and ticks. The fiercely armed greenbrier, though a nuisance to you, is valuable to the forest. It forms thickets that are virtually impenetrable by humans but provide protective cover for birds and mammals. Poison ivy, recognizable by its familiar three-parted leaves, grows in almost every Assateague site; it occurs as a trailing or climbing vine and as an erect shrub.

Loblolly Pine needles
and cones.

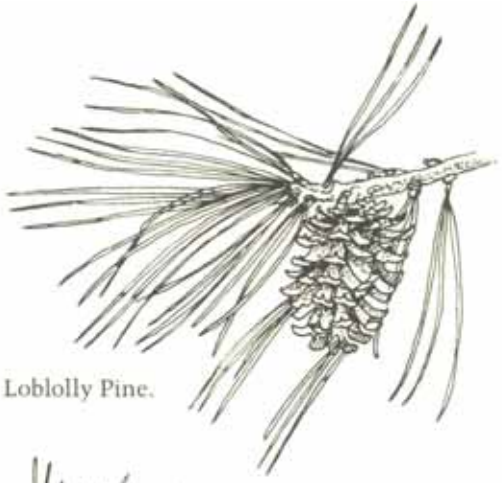
The fruits, foliage, and twigs of poison ivy and greenbrier are food for a wide array of forest animals, including white-tailed deer, sika (Japanese elk), cottontail, opossum, Assateague ponies, and more than 50 species of birds. But can we say anything good about the three species of ticks that swarm on the understory plants and in the leaf litter here? They too are part of the web of life in this forest community. For your own protection you should stay out of the underbrush; some deer ticks are known to carry the single-celled organism that causes Lyme disease in man.

Sika Deer (miniature Japanese elk) in a thicket of greenbrier upon which it browses.

Poison Ivy.

2 *PIONEER TREE. The grotesquely twisted loblolly pine began growing when this site was open duneland. Ocean winds and salt spray prevented it from achieving the height and symmetry characteristic of this species in protected zones. It is called a "pioneer" because it was among the first of its kind to gain a foothold in the harsh environment, and because it helped to create conditions that enabled other species to become established.*

Oceanward as well as in the forest edge you will see many younger pines. Note their straight trunks and undistorted branches. The high manmade ocean foredune (first built by developers in the 1950s) is accomplishing what pioneer trees used to do: it is sheltering young trees from salt spray and allowing them to grow straight.



Loblolly Pine.

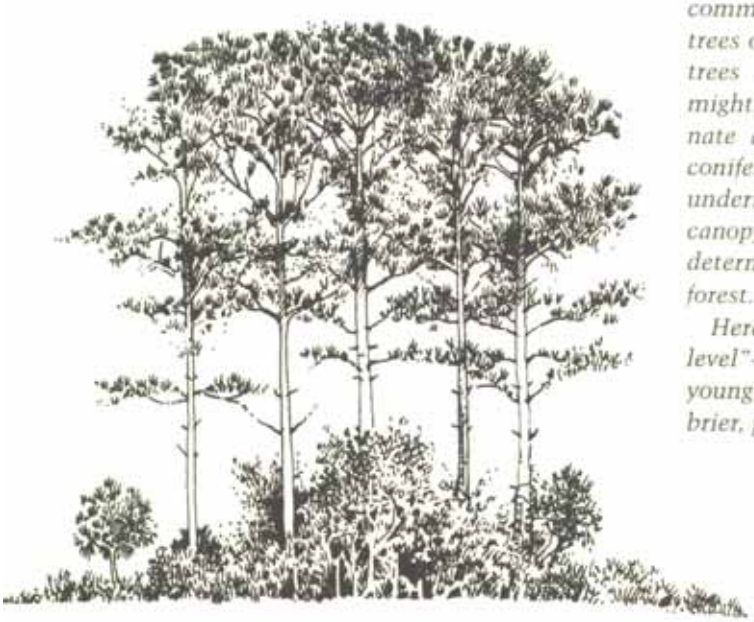
Virginia Pine.

Pitch Pine.

Except for the Loblolly, these pines are uncommon or rare on Assateague. A Pitch Pine stands at the beginning of the trail, immediately on the left; this is a dominant species in the New Jersey pine barrens.

Black Pine.

Profile of the Assateague Island pine forest community.

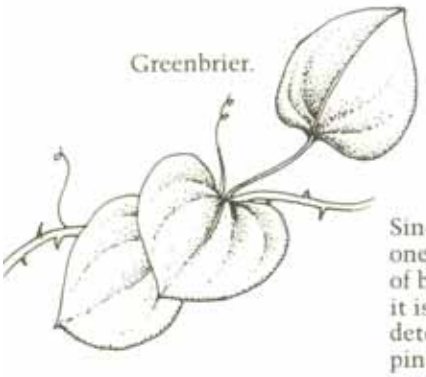


3 *THE LOBLOLLY PINE FOREST. Loblollies, by force of their numbers and their influence on other organisms, dominate this natural community. Like a human urban community, the forest is many-storied. The taller trees of the canopy, which includes a few broadleaf trees such as sweet gum, red maple, and oaks, might be compared to the skyscrapers that dominate a city skyline. The shade provided by the conifers is a major factor in determining which understory plants will occur. The nature of the canopy and understory vegetation in turn largely determines what animal species find a home in the forest.*

Here the understory—the community's "street level"—is made up of herbs, shrubs, vines, and young trees. In the denser parts of the forest, greenbrier, poison ivy, and bayberry dominate the under-

story. Where more light penetrates the canopy, arrowwood, serviceberry, and highbush blueberry thrive.

The burrows of rodents and insects amongst the tree roots are the forest community's basements and subway system. As in a human community all the living things here are interrelated and interdependent—directly as in food chains, or indirectly as in competition for food and living space.



Greenbrier.

Since pines produce one layer, or whorl, of branches each year, it is possible to determine the age of a pine by counting the spaces between whorls.

4 A SHELTERED ENVIRONMENT. Well back from the influence of salt-laden winds that limit the upward growth of trees, loblollies and red maples create a higher forest canopy of undistorted trees. (The salt-sensitive maple leaves exposed at the top may be burned.) Here even wax-myrtles attain the stature of small trees—a height of more than 20 ft.

The Red Maple is often called Swamp Maple when growing in wetland environments.

5 A CHANGING MARSH HABITAT. Until the mid-1970s this site was a freshwater reed and cattail marsh with crimson-eyed rose-mallow intermixed. Common reed [Phragmites communis] *has taken over, and cattail is no longer present. A few straggling mallows remain to display their large white blossoms in late summer.* Phragmites *is less favorable for wildlife than cattails; and it tends to dominate its sites, with greatly decreased plant diversity resulting. At this location it is mixed with bayberry and shrub-form poison ivy, which do have substantial value for animals*

Reaching 15 or more feet in height, Phragmites *is Assateague's tallest grass. Luxuriant green growth of spring and summer contrasts sharply with the dead gray/brown stalks of winter that may stand for a year before decay processes and wind bring them down.*

White-tailed deer in *Phragmites*.

6 *A BIRD OF THE FOREST FLOOR. The rufous-sided towhee, a year-round resident of Assateague Island woodlands, is smaller than the somewhat similar robin. Like the robin it spends much time on the ground; it typically finds food by turning over dead leaves. You can recognize it by its chestnut sides and black upper parts (brown in the female) and by the white tail corners, which flash when it flies up. Its song is described in human terms as "Drink-your-tee-e-e-e," with the "tee" on a higher note. Its call is a loud "che-wink!"*

Other birds that nest and winter in the Assateague forest are cardinals, catbirds, mourning doves, northern flickers, screech owls, great horned owls, and Carolina wrens. And—would you believe! —house wrens nest in these woods.

The Rufous-sided Towhee is more often heard than seen. Pause quietly here and at other places along the trail to listen for this and other songbirds.

7 *TRANSITION TO MARSH. Here where forest merges into open marshland you find species of both communities forming a transition zone, or ecotone. Loblolly pine, greenbrier, poison ivy, bayberry, and an occasional redcedar give way to marsh-elder, groundsel-tree, saltmeadow cordgrass, and sedge (*Carex *sp.). In late summer the pinkish-lavender blossoms of salt-marsh fleabane add a scattering of color to this high marsh community.*

The chief factor in the creation of this transition zone is the drop in elevation from the forest to the marsh. Saltmarsh cordgrass grows at levels inundated by only the highest tides; forest growth begins just a little above high-tide line. Moisture and salinity are factors controlling which species can grow in any zone on the barrier island.

Groundsel-Tree leaves.

Marsh-Elder leaves.

Groundsel-Tree produces striking white seed tufts each October.

8 *BLACK RUSH (NEEDLERUSH). Often called black grass, this true rush grows only in the higher parts of salt and brackish marshes. Emerging dark stems and leaves make it stand out in contrast to the shiny pea green of saltmeadow cordgrass. The dead gray, needlelike spikes are last year's growth. It is valuable as cover for small animals—particularly rails, which often nest in it.*

9 *PREDATION. Any animal that takes other living animals for food is a predator. The chickadee feeding on insect larvae gleaned from the bark of trees is as much a predator as the screech owl that feeds on the chickadee. In the marshland the most conspicuous predators are the wading birds—herons and egrets—and the northern harrier ("marsh hawk") that is often seen in hedge-hopping flight as it hunts small mammals and birds. In the Assateague forest the carnivorous great horned owl is at the top of the food chain, for it is not normally taken by any other predator. The white-tailed deer, an herbivore (plant eater), does not now have predators other than man in this region; its natural enemies—large carnivores such as the timber wolf or cougar—have long since been exterminated from the Middle Atlantic States. The mourning dove is perhaps the only common bird in this community that is entirely herbivorous. Other than owls, the only exclusively predatory vertebrate animals here are shrews, snakes, bats, and hawks.*

The Great Horned Owl preys on birds (including other owls), large insects, shrews, rodents, bats, and cottontails (probably its most important food).

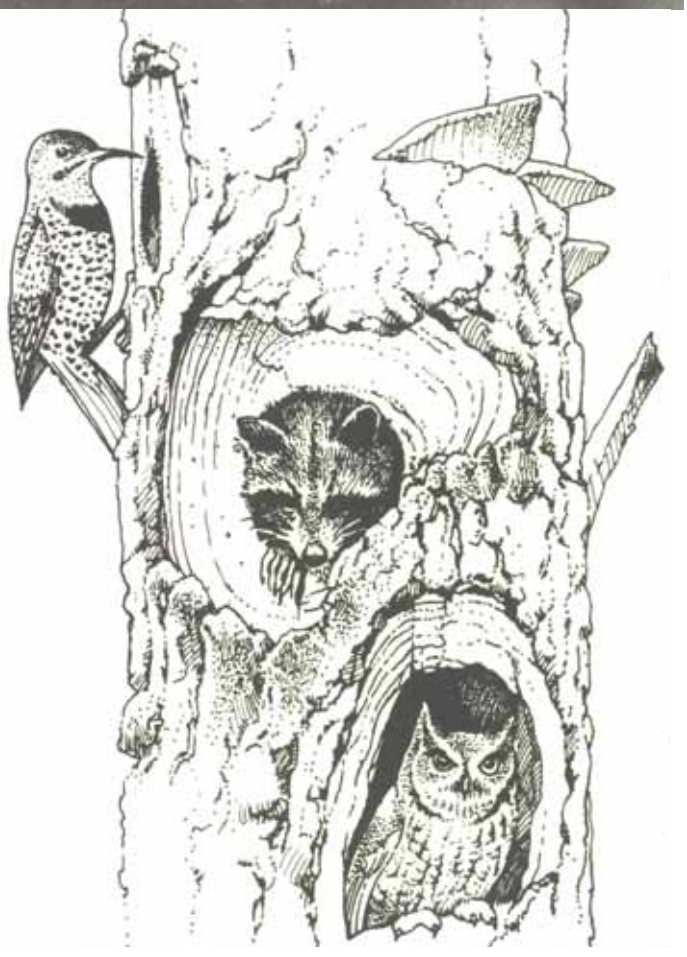
Serviceberry blossoms.

10 GOOD EATING FOR FOREST CREATURES. Serviceberry and highbush blueberry produce abundant fruits that are valuable to many species. Serviceberries, related to apples, plums, and raspberries, are tall shrubs or small trees that generally grow in clumps. They may reach 40 ft. in height. There are several species—the Canadian serviceberry is the only one found here—and you may find them referred to as juneberry, shadbush, or shadblow. They are widespread, but are scattered on Assateague.

All around you is highbush blueberry, occurring in dense thickets when moisture and light conditions are favorable. Humans are not the only animals that savor the fruits of serviceberry and blueberry; in this island community they are eaten by the mourning dove, catbird, mockingbird, brown thrasher, flicker and other woodpeckers, towhee, red fox, opossum, and raccoon.

Highbush Blueberry blossoms.

The biological diversity of a forest community is enhanced when dead trees are allowed to remain until the cycle of natural decay processes has run its course.



11 *HABITATS. You are nearing the end of this trail through a* natural community*—an association of plants and animals occupying a physical habitat. A* habitat *for wild animals—as for humans—is an environment that provides them with their basic needs: food, water, oxygen, shelter from the elements and natural enemies, and living space with conditions for reproducing their own kind. One animal may provide shelter for another; for example, the screech owl may take over an old flicker nesting cavity—created by that woodpecker for its own nesting activity. In preserves such as Assateague, dead trees are left standing until natural forces topple them. Dead and decaying trunks are a valuable component of wildlife habitat—not only for nesting owls and woodpeckers, but for a wide array of less conspicuous creatures that are important parts of the forest food web. Perhaps there is a patch of woods near your home in which the same benefits to wildlife can be maintained if natural processes are allowed to operate unhindered.*

LIFE OF THE

MARSH

1 *BRUSHY EDGE ZONE. Young black cherry trees are a dominant plant in this transition zone at the edge of the coastal marsh community. The wild black cherry is often associated with loblolly pine in eastern maritime forests; on Assateague you will also see it on the forest and duneland trails. At the end of this trail and along the edge of the parking lot, be sure to look closely at the mature cherry trees riddled with small holes bored by the yellow-bellied sapsucker, a woodpecker that winters on Assateague.*

This site is a very good place to linger a few moments; songbirds are abundant here in spring. Look and listen for red-winged blackbirds, yellow warblers, boat-tailed grackles, catbirds, and kingbirds. With luck you may see indigo buntings.

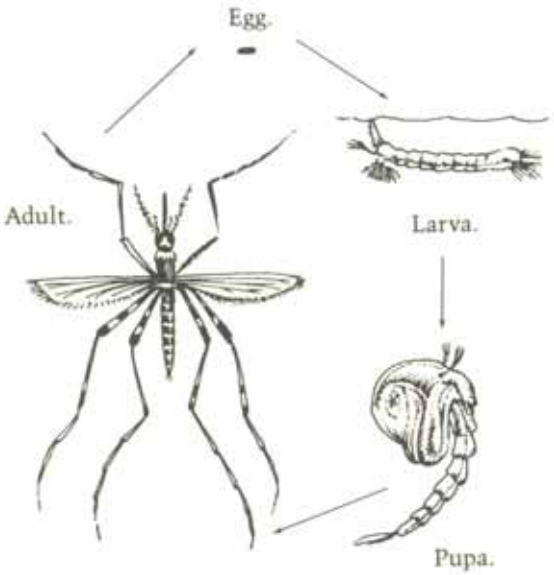
The matted growth of Saltmeadow Cordgrass contrasts with the erect form of Saltmarsh Cordgrass in the transition from high to low marsh.

2 *SPOIL BANK VEGETATION. Spoil banks, built from dredged material, may form a dike that can be used as a roadway or, as was intended here, to shelter boats in a marina. Because it creates a habitat above the highest tides for non-aquatic plants, it enhances the variety of vegetation in the marshland, attracting terrestrial birds and mammals and providing nest sites for marsh and shore birds.*

On this spoil bank, along with the groundsel-tree (a typical high-marsh shrub), grows winged sumac. This harmless relative of poison ivy usually grows as a shrub, but here it's a small tree. Also present is dog-fennel, which in summer has graceful, lustrous-green foliage. A perennial in the thistle family, it grows in fields and disturbed areas from Assateague Island south. Clumps of dead dog-fennel stems remain standing through winter; in April the roots send up new green growth.

Note the winged leaf midribs of Winged Sumac: poison sumac (not found on Assateague) lacks this feature.

Life history of the Saltmarsh Mosquito.



3 *MEN, MACHINES, AND MARSHES. The scalloped edge of the marsh across the manmade channel on either side was created by the treads of a bulldozer as it backed up while building this dike. This alteration of the marshland ecosystem was made as part of a project initiated in the 1950s to develop all the Maryland portion of Assateague Island. (It was not until 1965 that Assateague was made a part of the National Park System.)*

The narrow ditches you will see in the marsh on your right as you cross the bridge were intended as a control on the saltmarsh mosquito. Ironically, such measures sometimes actually enhance mosquito breeding, as well as destroy or drastically alter wildlife habitat and convert salt marsh to scrubland or to stands of Phragmites. *Some pesticides sprayed for mosquito control can kill other species. Keep in mind that the larvae, pupae, and adults of mosquitos are food for many fishes and birds and thus are an important link in island food chains.*

What do the bulldozer tracks and mosquito ditches tell you about the capacity of salt marshes to recover from the alterations of man!

4 *MARSH GRASSES. In the eastern U.S., coastal wetland zones regularly inundated by high tides are commonly vegetated with saltmarsh cordgrass* (Spartina alterniflora). *You see it along the edges of the tidal channels, but in some areas it may constitute extensive marshes. On Assateague, another marsh plant, seashore saltgrass* (Distichlis spicata), *is commonly mixed in with saltmarsh cordgrass a short distance from the water's edge. (It is more tolerant of salinity than the following species.)*

Just in front of the shrubs that you see in the distance are slightly higher tidal flats that are inundated only by storm tides or the highest lunar tides. These are often dominated by saltmeadow cordgrass (Spartina patens). *(This grass is sometimes called salt hay because early tidewater farmers cut it for livestock.) The two kinds of cordgrass are easily distinguished. Saltmarsh cordgrass, with wide leaf blades, grows to about 3 ft. in height and remains erect. The narrow leaves of saltmeadow cordgrass become matted into "cowlick" swirls. A third species, big cordgrass* (Spartina cynosuroides), *grows in a number of areas around the Chesapeake Bay but is rare here.*

The Spartina *grasses are among the most important of all wild plants, for they support a vast array of vertebrate and invertebrate coastal animals and furnish much of the nutrient material that is the food base for adjacent marine communities and for the shallow seas along the coast.*

5 *GLASSWORTS. Growing amongst the marsh grasses here is slender glasswort (sometimes called saltwort—a name that more properly belongs to a plant of the sea beach,* Salsola kali*). Glassworts (*Salicornia *species) are members of the spinach family, which includes such edibles as beets and chard. They produce tiny brown flowers; the leaves are mere fleshy sheaths on the translucent stems. In autumn they turn the marsh into a rich red carpet sprinkled with the violet of the delicate sea lavenders.*

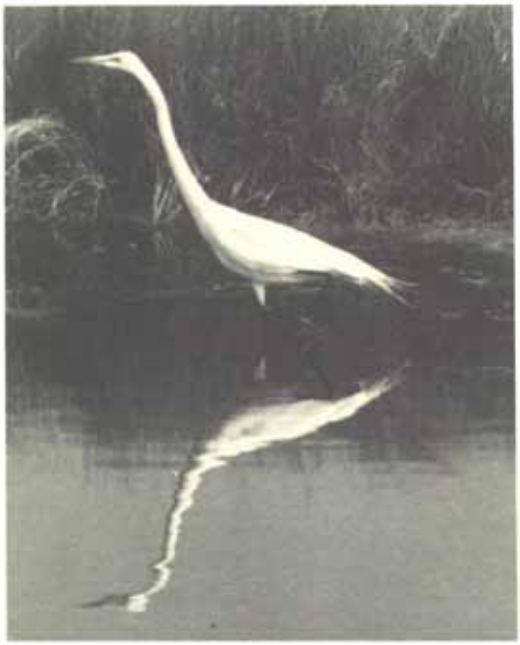
6 *SALT PANNES. Depressions in the high marsh that are inundated by only the highest tides, may, owing to evaporation, become hypersaline—with soil too salty for most marsh plants. Purple sulfur bacteria may thrive in these bare areas, exuding "rotten-egg" gas odors associated with salt marshes. Naturally produced "oil" may also be seen on the surface in such locations. Eventually these salt pannes may be colonized by such salt-tolerant plants as glassworts; these can actually help remove excess salt from the soil, eventually allowing normal succession cycles to proceed.*

Sometimes snow or Canada geese may remove completely the rootstocks of a patch of marsh grass, resulting in a similar barren depression called an eatout.

Slender Glasswort creates a miniature forest in a high marsh spot where soil salinity is too great for cordgrass.

Snow Geese feeding in an Assateague Island marsh. NATIONAL PARK SERVICE

7 *MARSH BIRDS. Wading birds, shore birds, gulls, songbirds, and even hawks and owls utilize the rich food resource of the salt marsh. The snowy egret, most common of the heron-egret family at Assateague, wades in the shallows, stirring up the sediments with its yellow feet and snatching with its bill invertebrates and small fishes. The greater yellowlegs, a shore bird, wades in water up to its belly and probes the sediments with its long bill to feed on crustaceans and fishes—sometimes surprisingly large prey for such a slender bird. The northern harrier ("marsh hawk") and (occasionally) the short-eared owl are seen flying low over the marsh hunting rodents and other small animals. The willet is one of the shore birds that commonly use the marshland as a nesting site. This large member of the sandpiper family appears as a drab, gray-brown bird when resting, but in flight it displays a striking black-and-white wing pattern.*



The Willet, one of the most common shore birds, is seen in bayshore marshes as well as on the ocean beach.

The Great Egret hunts in the marsh for fish and invertebrates.

8 ARE WETLANDS WASTELANDS? Wetlands may be freshwater, saltwater, or brackish. Swamps are wetlands dominated by woody plants (trees and shrubs); marshes are wetlands dominated by cattails, grasses, or other soft-stemmed plants.

Owing to their great productivity and importance as wildlife habitat, salt marshes are the most valuable of all wetlands. They support a great diversity of birds, mammals, crustaceans, mollusks, and other wildlife. They are nurseries for many game and market fishes harvested from brackish and salt waters. Decaying plant fragments (detritus) from marshes are a major component of the nutrients flowing through the estuaries and coastal seas.

Sadly, these habitats, so essential to the welfare of humans and wildlife, have been destroyed at a fearsome rate. Wetland preservation laws now provide a measure of protection, but the attrition continues. National parks and other public preserves along the coasts are thus of immeasurable importance.

The entire Assateague bayside in Maryland narrowly escaped the fate of the marshlands of nearby Ocean City. The great northeaster of March 1962 was seen as a disaster by those along the Middle Atlantic coast who suffered property loss from storm waves and winds. And it raised questions about the wisdom of real-estate development on barrier islands in general and Assateague Island in particular. This storm was the single most important event leading to the establishment in 1965 of Assateague Island National Seashore.

Housing and other developments encroach on the few remnants of Ocean City's bayside marsh. Due to the great northeaster of 1962, Assateague's important marshlands narrowly escaped this fate.

9 *COMMON REED* (Phragmites communis). *This tall grass is a widespread species that grows in both fresh and brackish marshes, around springs, on bayshores and banks of lakes and streams, and on spoil banks. It is considered a pest in many natural preserves, where its dense growth rapidly crowds out species more valuable to wildlife. Red-winged blackbirds often perch on its swaying stalks; and such colony nesters as cattle egrets, glossy ibises, and black-crowned night herons sometimes nest on or near the ground in dense* Phragmites *stands on dredge deposition sites. Ponies are sometimes seen munching on the green shoots. It may serve to protect bayshores from erosion in some sites; and Native Americans used the stems for arrow shafts and (in the southwest) for mats, screens, thatching, and lattices for adobe construction.*

Like most grasses, Phragmites *spreads primarily by underground stems called rhizomes, rather than by germination of seeds.*

The Brown Pelican is expanding its range northward; the species first nested in Maryland on a small Chincoteague Bay island in 1987. Immature birds are seen here in a nest constructed primarily of *Phragmites*.
DAVE BRINKER

SCIENTIFIC NAMES OF PLANTS AND ANIMALS MENTIONED IN THIS BOOKLET

An organism may go by a different common name in different regions or even in the same locality; or a name may be applied to two or more related or unrelated species. Most species, lacking a common name, are known only by the Latin binomial.

FUNGI
Crowned Earthstar - *Geaster coronatus*

GRASSES, RUSHES, CATTAILS
American Beachgrass - *Ammophila breviligulata*
Big Cordgrass- *Spartina cynosuroides*
Black Rush - *Juncus gerardii*
Broad-leaved Cattail - *Typha latifolia*
Common Reed - *Phragmites communis*
Narrow-leaved Cattail - *Typha angustifolia*
Panicgrass - *Panicum virgatum*
Saltmarsh Cordgrass - *Spartina alterniflora*
Saltmeadow Cordgrass - *Spartina patens*
Seashore Saltgrass - *Distichlis spicata*

WILDFLOWERS
Blue Toadflax - *Linaria canadensis*
Dusty Miller - *Artemisia stelleriana*
Glasswort - *Salicornia* spp.
Purple Gerardia - *Gerardia purpurea*
Saltwort (Russian Thistle) - *Salsola kali*
Seabeach Evening-primrose - *Oenothera humifusa*
Seaside Goldenrod - *Solidago sempervirens*
Swamp Rose-mallow - *Hibiscus palustris*

WOODY PLANTS
American Holly - *Ilex opaca*
Blackberry - *Rubus* spp.
Black Cherry - *Prunus serotina*
Black Pine - *Pinus nigra*
Canadian Serviceberry - *Amelanchier canadensis*
Common Greenbrier - *Smilax rotundifolia*
Common Wax-myrtle - *Myrica cerifera*
Dog-fennel - *Eupatorium capillifolium*
Glaucous Greenbrier - *Smilax glauca*
Groundsel-tree - *Baccharis halimifolia*
Highbush Blueberry - *Vaccinium* spp.
Loblolly Pine - *Pinus taeda*
Marsh-elder - *Iva frutescens*
Northern Bayberry - *Myrica pensylvanica*
Pitch Pine - *Pinus rigida*
Poison Ivy - *Rhus radicans*
Post Oak - *Quercus stellata*
Redcedar - *Juniperus virginianus*
Red Maple - *Acer rubrum*
Muscadine Grape - *Vitis rotundifolia*
Southern Red Oak - *Quercus falcata* var. *falcata*
Southern Arrowwood - *Viburnum dentatum*
Sweetgum - *Liquidambar styraciflua*
Trumpet Creeper - *Campsis radicans*
Virginia Creeper - *Parthenocissus quinquefolia*
Water Oak - *Quercus nigra*
Wax-myrtle - *Myrica cerifera*
Willow Oak - *Quercus phellos*
Winged Sumac - *Rhus copallina*
Woolly Hudsonia - *Hudsonia tomentosa*

ARACHNIDS AND INSECTS
Burrowing Wolf Spider - *Geolycosa* spp.
Deer Tick - *Ixodes dammini*
Dog Tick - *Dermacentor variabilis*
Doodlebugs (Antlions) - (Family Myrmeleontidae)
Saltmarsh Mosquito - *Aedes sollicitans*
Spider Wasps - (Family Pompilidae)

AMPHIBIANS AND REPTILES
Fowler's Toad - *Bufo woodhousei fowleri*
Eastern Hognose Snake - *Heterodon platyrhinos*

BIRDS
American Goldfinch - *Carduelis tristis*
American Robin - *Turdus migratorius*
Black-crowned Night Heron - *Nycticorax nycticorax*
Boat-tailed Grackle - *Quiscalus major*
Brown Thrasher - *Toxostoma rufum*
Canada Goose - *Branta canadensis*
Carolina Chickadee - *Parus carolinensis*
Carolina Wren - *Thryothorus ludovicianus*
Cattle Egret - *Bubulcus ibis*
Clapper Rail - *Rallus longirostris*
Eastern Kingbird - *Tyrannus tyrranus*
Glossy Ibis - *Plegadis falcinellus*
Gray Catbird - *Dumetella carolinensis*
Greater Yellowlegs - *Tringa melanoleuca*

Great Horned Owl · *Bubo virginianus*
House Wren · *Troglodytes aedon*
Indigo Bunting · *Passerina cyanea*
Mourning Dove · *Zenaida macroura*
Northern Bobwhite (Quail) · *Colinus virginianus*
Northern Cardinal · *Cardinalis cardinalis*
Northern Flicker · *Colaptes auratus*
Northern Harrier ("Marsh Hawk") · *Circus cyaneus*
Northern Mockingbird · *Mimus polyglottos*
Red-winged Blackbird · *Agelaius phoeniceus*
Rufous-sided Towhee · *Pipilo erythrophthalmus*
Short-eared Owl · *Asio flammeus*
Snow Goose · *Chen caerulescens*
Snowy Egret · *Egretta thula*
White-throated Sparrow · *Zonotrichia albicollis*
Willet · *Catoptrophorus semipalmatus*
Yellow-bellied Sapsucker · *Sphyrapicus varius*
Yellow-rumped Warbler · *Dendroica coronata*
Yellow Warbler · *Dendroica petechia*

MAMMALS

Eastern Cottontail · *Sylvilagus floridanus*
Feral Pony · *Equus caballus*
Muskrat · *Ondatra zibethica*
Raccoon · *Procyon lotor*
Red Fox · *Vulpes fulva*
Opossum · *Didelphis marsupialis*
Sika · *Cervus nippon*
White-footed Mouse · *Peromyscus leucopus*
White-tailed Deer · *Odocoileus virginianus*

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Red Fox dig dens into the sides of Assateague dunes to give birth and raise their young.